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1	1.	A system	for	automatically	producing	ar
2	embroidery	design,	the	system compris	sing:	

- means for inputting an embroidery pattern a) into an image data file, the image data file comprising a plurality of pixels, each pixel comprising a bitmap representing a color;
- processing means operatively connected to b) said inputting means for storing said image data file; and
- C) an embroidery data generating mechanism operatively connected to said processing means for generating a complex embroidery pattern directly from a scanned, color image.

	1	4	z. The sy	ystem of claim 1, wherein said embroidery
	2	data q	generating	g mechanism comprises:
	3		i)	segmenting means for characterizing each
	4			pixel within the image data file into an
	5			object;
	6		ii)	means for classifying each of said
	7	~		objects as a thin object or a thick
	8			object;
7				
	9	•	iii)	means for locating and interpreting a
	10			set of regular and singular regions for
	11			embroidery data point generation.
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=	12		iv)	path generation means for computing an
0 4	13			optimum sew order for at least one
	14		•	extracted column; and
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	15		v)	embroidery output means for generating
	16			an embroidery output file.

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1	The system of claim 1, further comprising
2	line-fitting means for line-fitting each object,
3	wherein an object comprises an outer contour, a
4	predetermined number of inner contours, and a skeleton
5	contour, said line-fitting means comprising a gallus-
6	neurath triangular filter.

- 4. The system of claim 3 further comprising
 stitch angle determination means for determining a
 stitch angle that produces a minimal plurality of
 fragments.
 - 5. The system of claim 4, further comprising generate path means for determining an optimal order for the plurality of fragments to be sewn.
 - 6. The system of claim 1, further comprising labelling means for labelling a plurality of points on the skeleton and edge contours.
- 7. The system of claim 6, further comprising
 merging means for merging a series of points from the
 plurality of points on the skeleton contour.

1	8. The	system of claim 7,	further comprising
2	coding means	for evaluating a p	lurality of singular
3	regions.		

- 9. The system of claim 8, further comprising
 smoothing means for evaluating a sequence of stroke
 normals.
- 1 10. The system of Claim 1, wherein means for 2 inputting comprises a scanner.
 - 11. The system of claim 1, wherein said object comprises a plurality of connected or contiguous pixels having a uniform color.

1	12.	A method for automatically producing an
2	embroider	y design, the method comprising the steps of:
3	a)	inputting an embroidery pattern into an image
4		data file, the image data file comprising a
5		plurality of pixels, each pixel comprising a
6		bitmap representing a color;
7	b)	classifying and line-fitting each object in
8		said bitmap as a thin object or a thick
9		object, each of said objects comprising an
10		outer contour, any number of inner contours,
11		and a skeleton contour;
12	c)	computing an optimum sew order; and
13	d)	generating an image output file.
1	13.	The method of claim 12, further comprising

1 14. The method of claim 13, further comprising 2 the step of determining an optimal order for the 3 plurality of fragments to be sewn.

the step of generating the plurality of fragments.

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- 1 15. The method of claim 14, further comprising
 2 the step of merging a series of points from the
 3 plurality of points on the skeleton contour.
- 16. The method of claim 15, further comprising
 the step of extracting at least one column.
 - 17. The method of claim 16, wherein said step (b) of classifying each pixel within the image data file comprises the step of associating each connected pixel having a similar color with a unique object identity.
 - 18. The method of claim 17, wherein said step (b) of classifying additionally comprises the step of traversing a plurality of chain codes associated with one of the group of skeleton contour, inner contour(s), and outer contour.
 - 19. The method of claim 14, wherein said step of determining an optimal order for the plurality of fragments to be sewn comprises the step of identifying a point and recursively identifying a plurality of fragments touching said point.

	1	20.	A method for automatically producing an
	1	embroidery	design, the method comprising the steps of:
	2	a)	inputting an embroidery pattern into an image
	3		data file, the image data file comprising a
	4		plurality of pixels, each pixel comprising a
	5		bitmap representing a color;
	6	b)	locating a set of regular and singular
	7		regions disposed in said image data file;
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	8	c)	interpreting said set of regular and singular
U.	9		regions;
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. ≟	10	d)	computing an optimum sew order; and
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# C. P. C.	11	e)	generating an image output file dependent on
. Garde. Garde Afrair.	12		said interpreted set of regular and singular
-	13		regions.